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INT CL⁵ G09F, H01R

(54) Terminal with identification carrier

(57) The electric cable end terminal comprises a conducting part (2) for electrically connecting to a conducting core (4) of the cable (5) and also comprises an insulating body (3) mechanically connected to the conducting part (2). The body (3) has an appendage (11) for holding a cable identification mark. The appendage is a tubular sleeve (11) disposed around the cable and at least partly detachable from the body (3) so as to rotate around the cable (5).

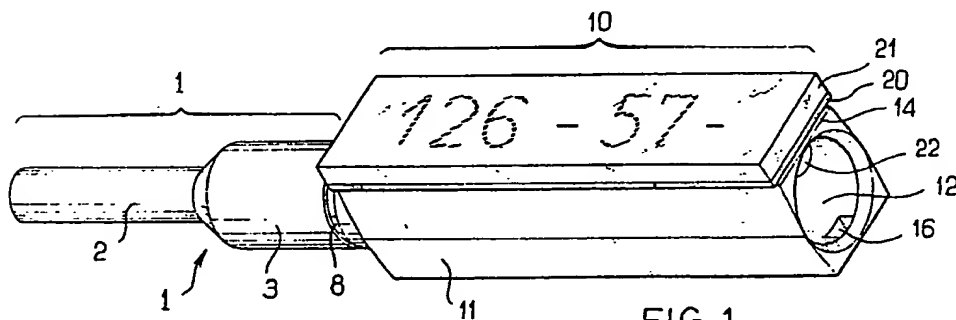


FIG. 1

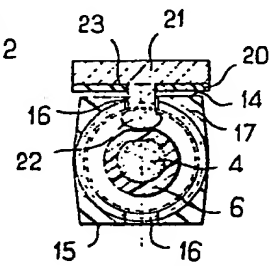


FIG. 3

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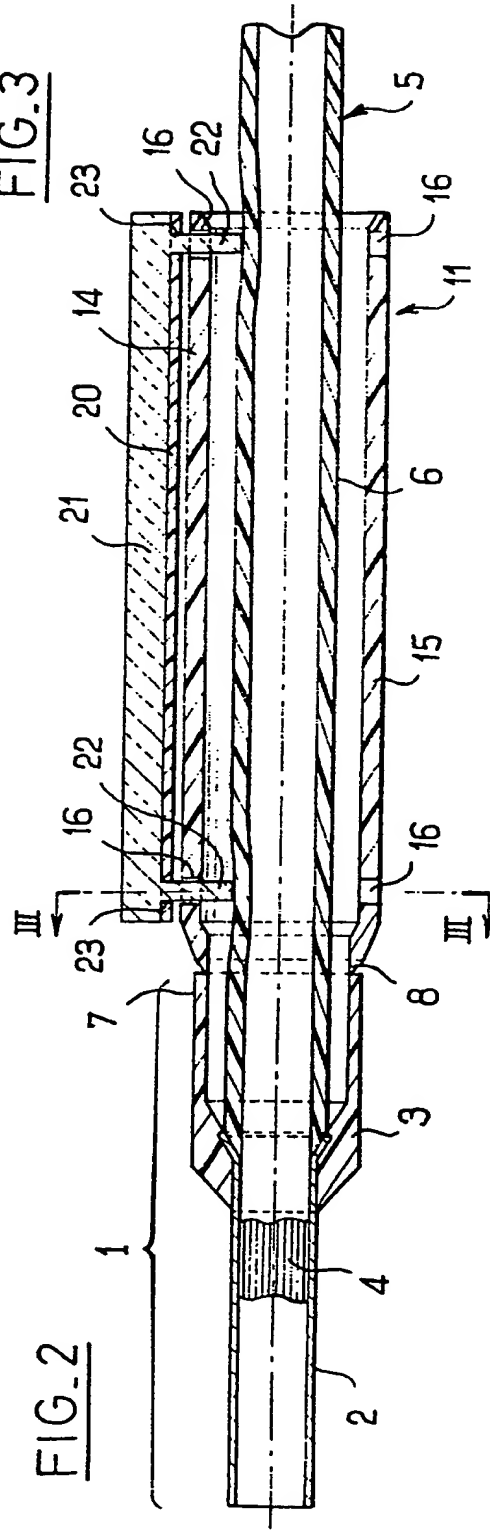
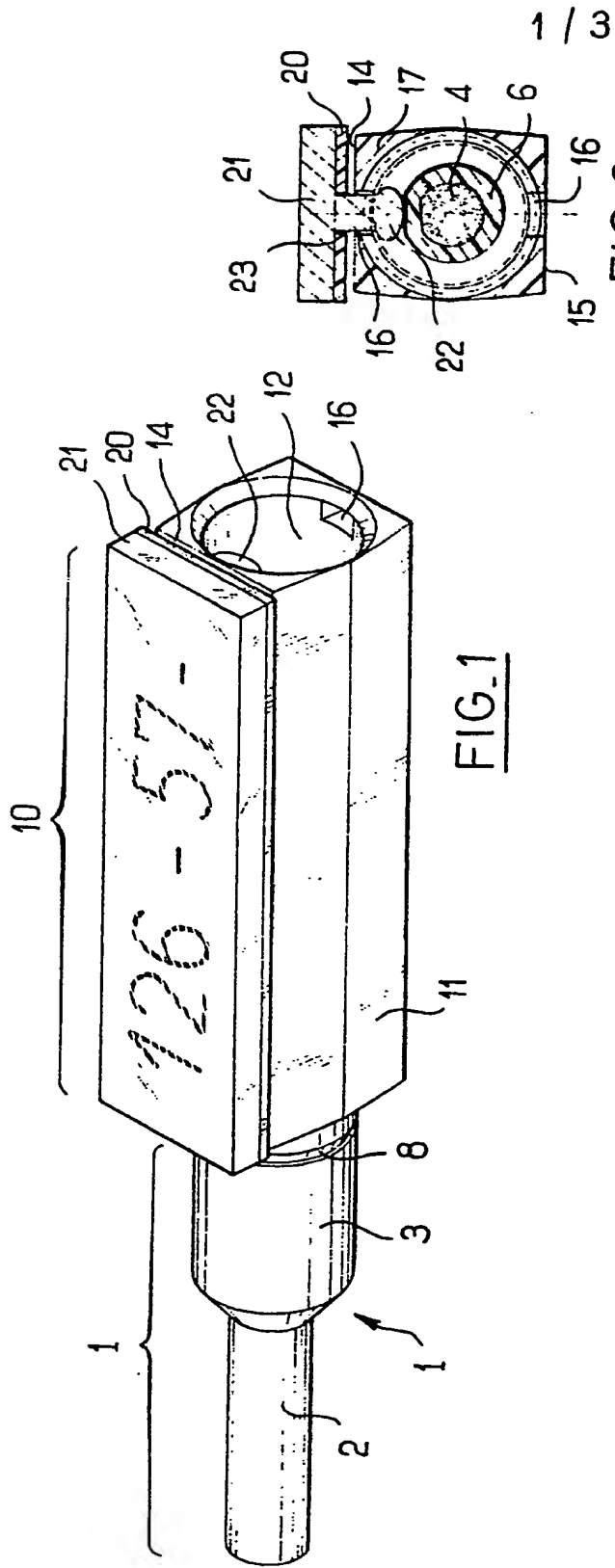
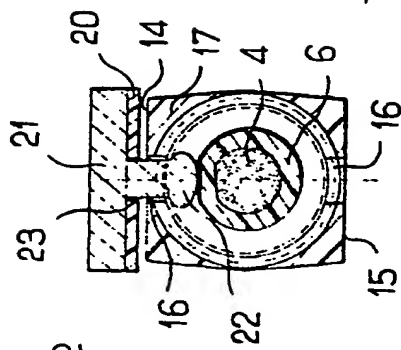
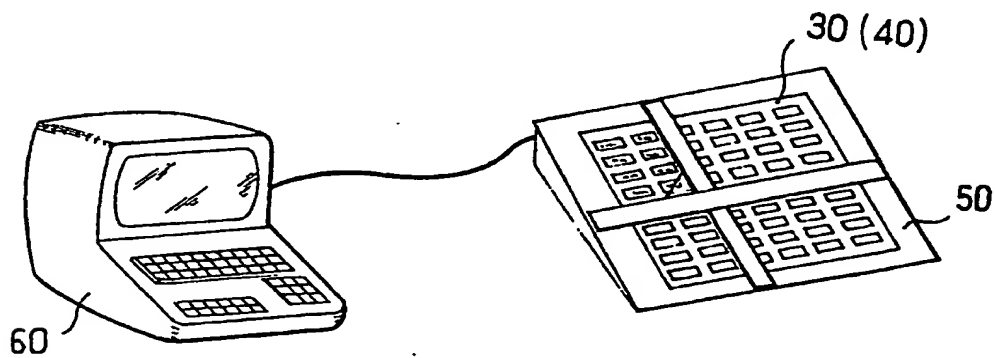
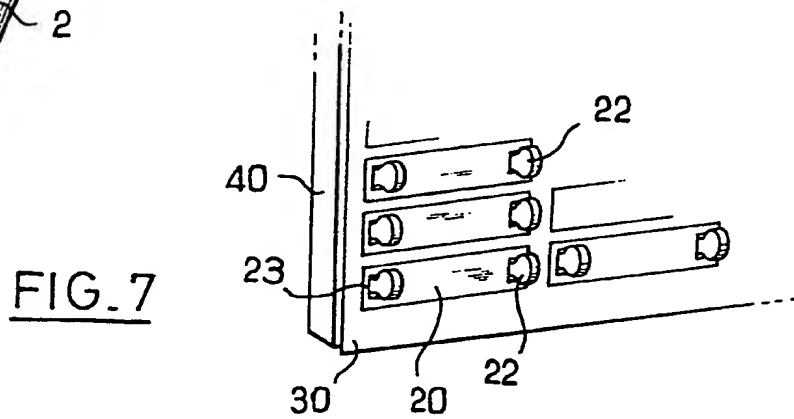
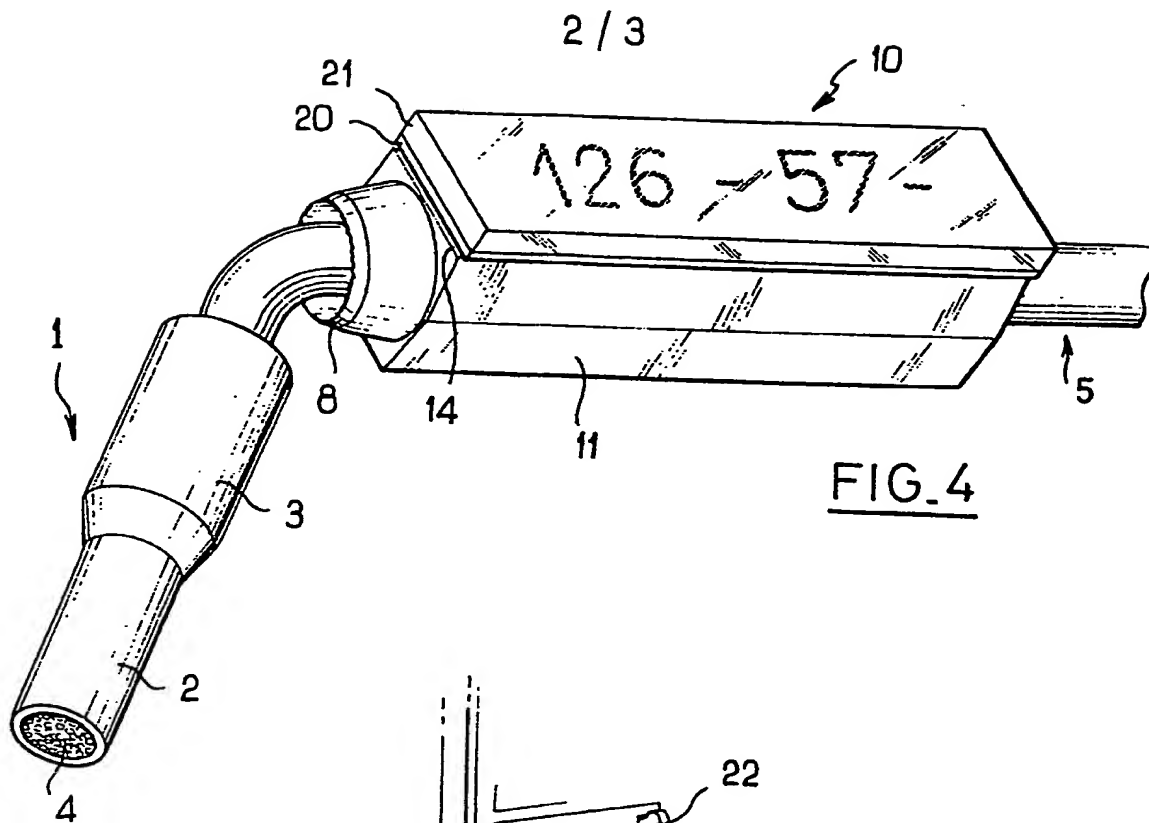


FIG. 3

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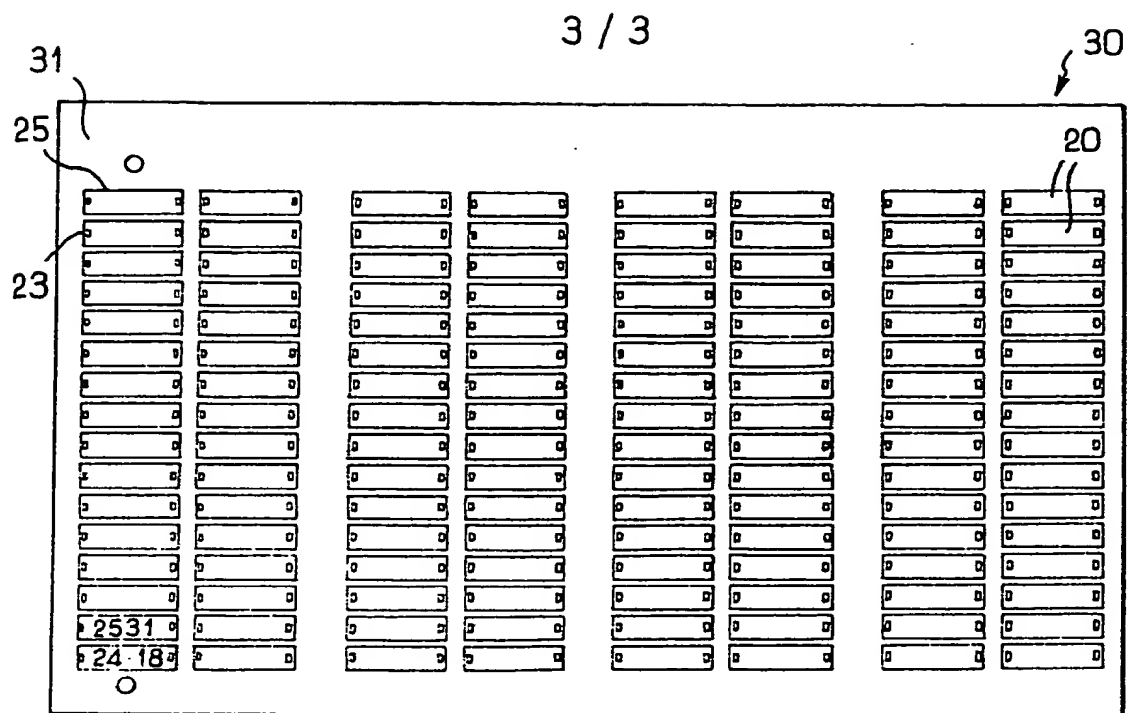


FIG. 5

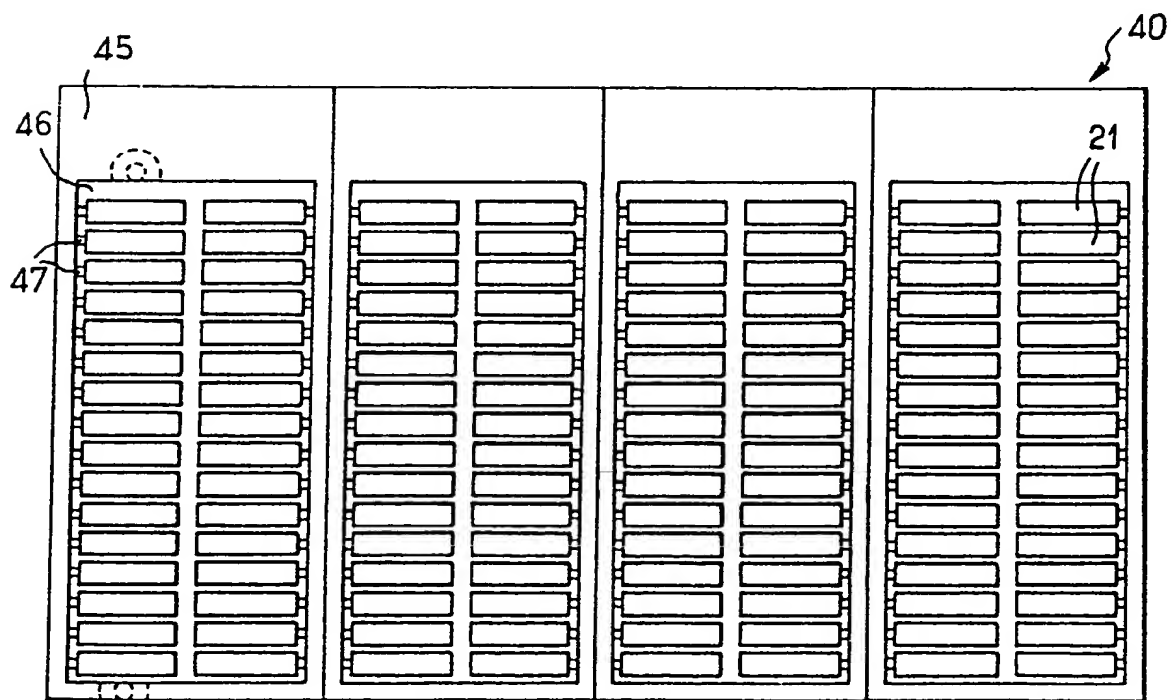


FIG. 6

Title: An Electric Cable End Terminal

The invention relates to an end terminal of an electric cable, comprising a conducting part for electrically connecting to a conducting core of the cable, and also comprising an insulating body mechanically connected to the conducting part, the body comprising an appendage for holding a cable identification mark.

Terminals of this kind are designed to stiffen and hold the ends of multiple-strand cable conductors so as to help in connecting them to a connecting terminal, and they are also used to hold a cable identification mark. They are used in electrical installations, inter alia when relatively complex. Owing to the large number of electric cables, each must be rapidly identifiable to avoid a tedious search and the risk of error when making a connection or disconnection. Since the terminals bear marks identifying the cable, they are also valuable when locating faults.

Terminals of this kind are known from the applicants' FR-A-2 477 330, according to which the appendage bearing the identification mark is a tab which axially prolongs the terminal on the end remote from its conducting end. Movable rings, each bearing a figure or digit or the like, are slid around the tab and the combination of figures constitutes the mark. The tab itself is removable, so that the cable identification can be modified without dismantling the terminal, or the terminal can be fitted without the tab when the cable does not have to be marked.

However, numerous small components have to be manipulated when manufacturing and mounting the tab, which increases the expense.

Also, when a number of terminals are very close to one another, the numerous tabs may cause problems of bulk. If the cables can be bent, the tabs do not follow the cable and form a bulky, irregular and unsightly fringe, each component of which is difficult to identify.

Another embodiment of this kind of identification terminal is known from EP-0-115 055, where the identification mark holder is a radial projection from the insulating body of the terminal. The disadvantage of this device is that either the mark is too close to the terminal and therefore difficult to read or the device is relatively long, which may cause even more serious problems of bulk than the previous embodiments, since the cable can be bent only at the outlet of the device.

In these known embodiments of a cable terminal, the direction of the appendage bearing the identification mark can be modified to reduce the bulk, but this makes the information less accessible.

The aim of the invention is to construct a terminal which identifies the cable and easily solves the problems of bulk and, more generally, of positioning the identification holder without needing to disconnect or re-connect the cable.

Another aim of the invention is optimum accessibility of the information carried by the terminal, as is necessary for immediate identification of the cable in question.

A third aim of the invention is to obtain great flexibility in the construction of the identification mark and in modifications thereof.

The invention relates to an end terminal of an electric cable, comprising a conducting part for electrically connecting to a conducting core of the cable, and also comprising an insulating body mechanically connected to the conducting part, the body comprising an appendage for holding a cable identification mark, characterised in that the appendage is a tubular sleeve disposed around the cable and at least partly detachable from the body so as to rotate around the cable.

In this manner, the direction of the identification mark holder can easily be modified without dismantling the end terminal.

In an advantageous embodiment, the sleeve holding the identification mark is connected to the body by at least one cuttable region. The body of the terminal and the sleeve thus form a single component, e.g. of moulded plastics, which is economic to manufacture and assemble.

If required, the sleeve is left integral with the body and thus has a well-defined position in the prolongation of the body. On the other hand, if

justified by considerations of bulk or the search for better legibility, the sleeve can be detached from the terminal body by twisting the cuttable region and rotating the sleeve around the cable. The sleeve then becomes detached from the fixed terminal, so that it can not only rotate but also move axially along the cable. The sleeve can therefore be rotated into a different direction and also moved some distance along the terminal in order to bend the cable or simply in order to offset the sleeve relative to adjacent cables.

In a preferred embodiment, the sleeve holds a plate for visually identifying the cable, means being provided for positioning the plate on the sleeve.

In this manner the cable can be marked at the last stage, when the terminal and the sleeve are already in position on the cable.

Also, the means for positioning the plate on the sleeve are designed to lock the sleeve on the cable when the plate is in position on the sleeve.

The terminal according to the invention, therefore, without the aforementioned disadvantages, for the first time combines the conventional function of a cable end terminal with the functions of a cable identification device, which is economic since the terminal part is in one piece with the appendage bearing the mark, and is also convenient owing to its ease of assembly and flexibility of use, and efficient since the information it carries is delivered under optimum conditions.

Advantageously, the sleeve has at least two different surfaces, either of which can receive the plate.

In one embodiment, the positioning means comprise at least one stud on the plate, for engagement in a corresponding orifice formed through the wall of the sleeve, so that after engagement the stud bears on the cable when the sleeve is mounted on the cable.

Accordingly, the stud on the plate and extending through the sleeve serves the double purpose of positioning the plate on the sleeve and locking the sleeve on the cable. Since also the stud is engageable, the plate is a movable component and it is therefore very easy to modify the positioning and marking.

The plate can be of opaque material suitable for marking to identify the cable. The marking can then be changed by changing the plate or by erasing the marking on the plate.

In a preferred method of marking, the opaque plates are automatically labelled by a computer plotting board, after the board has drawn the plan of the corresponding circuit.

In a variant embodiment, the plate is transparent and covers an identification mark without masking it. In a preferred embodiment, the marking is on a label positioned between the transparent plate and a substantially flat surface of the sleeve. Advantageously the plate comprises at least one stud,

in which case the label has at least one orifice for inserting the plate stud when the plate is positioned on the sleeve, the stud engaging in a corresponding orifice in the sleeve.

In addition to the great flexibility of use, some aspects of which have already been mentioned, other features and advantages of the invention will be clear from the following description.

In the accompanying drawings, given by way of non-limitative examples:

Fig. 1 is a three-quarter perspective view of a terminal according to the invention;

Fig. 2 is a longitudinal section through the terminal in Fig. 1, mounted on an electric cable;

Fig. 3 is a cross-section in the plane III-III in Fig. 2;

Fig. 4 is a perspective view of the terminal in Fig. 1, mounted on an electric cable, the sleeve being detached from the body of the terminal;

Fig. 5 is a top plan view of a board of labels constructed by a preferred method of manufacturing labels;

Fig. 6 is a top plan view of a board of plates constructed by a preferred method of manufacturing plates;

Fig. 7 is a partly cut-away perspective view of a board of label-and-plate assemblies, and

Fig. 8 is a diagram of an installation for labelling identification marks and comprising a computer and a plotting board.

With reference to Figs. 1 to 4, a cable terminal 1 comprises a tubular copper conducting part 2 secured to a funnel-shaped sheathed insulating body 3 coaxial with the conducting part 2. Part 2 is shaped so as to receive the conducting end 4, formed from multiple strands of an electric cable 5, the end part of which has been bared by removing a sheath 6. The conducting part 2 thus serves as a casing at the end of cable 4 and is of use in connecting it to a connecting terminal (not shown).

On the side of the input opening 7 remote from part 2, the body is connected via a cuttable annular region 8 to the sleeve 11 of an identification device 10, coaxial with the terminal 1. During manufacture, terminal 1 and sleeve 11 are made of plastics integrally with the cuttable intermediate region 8, which e.g. comprises narrow bridges of material extending axially between the terminal and the sleeve.

This one-piece construction enables the cable terminal and sleeve to be simultaneously positioned on the cable. Since the connection between them can be cut, the two components can be separated if necessary, in which case the sleeve can be positioned independently of the fixed cable terminal.

Sleeve 11, which has a substantially cuboid outer shape in the example shown, is formed with a duct 12 having a diameter greater than the diameters of all the range of cables 5 for which it is intended. This makes it easier to fit the sleeve on the cable 5. Two opposite flat surfaces 14, 15 of sleeve 11 are formed with a pair of symmetrical orifices 16 axially remote from one another and extending through wall 17 and opening into duct 12. A label 20 bearing the cable identification marking is fitted on surface 14 of sleeve 11. Label 20 is covered by a transparent plate 21 forming a protective cover.

A pair of studs 22 are formed on one surface of plate 21 and are made integrally of the same material and are axially spaced so as to fit into the orifices 16 in the sleeve. Plate 21 is positioned on sleeve 11 by simple pressure, when studs 22 extend through a pair of orifices 23 in label 20 before fitting into orifices 16 and bearing against the sheath 6 of cable 5. The studs 22 and orifices 16, 23 at each end are symmetrical, so that label 20 and plate 21 can be disposed in either direction. This avoids the need, before the wiring operation, of planning the direction in which the marking will be read in the wired installation.

Since sleeve 11 is integral with terminal 1, the main function of plate 21 is to protect the label 20 or, in the absence of a label, to serve as a medium for direct marking. If labels are not used, the plates 21 can be opaque with a surface suitable for direct marking. Since the studs are engageable, the plate is removable and can be positioned in either direction on the sleeve

and on either surface 14 or 15 and at the desired time, and can be easily replaced.

Another function of the plate, via the studs bearing on the cable, is to lock the sleeve on the cable, which happens when sleeve 11 is detached from terminal 1 as shown in Fig. 4.

After the terminal 1 secured to the identification device 10 has been mounted on cable 5, it may be desirable to move the identification device 10 along the cable or place it at a different angle, to reduce the axial bulk or to improve the visibility of the identification marking. In that case, after removing the plate 21 if in position, it is only necessary to detach sleeve 11 by twisting it off the fixed terminal 1 in order to break the cuttable region 8. Once it has been decided to position the identification device 10, the plate 21 can again be engaged in sleeve 11 so as to lock it and prevent any accidental rotation or axial movement on the cable.

When the cuttable region 8 has been broken, the cable 5 can if required be bent substantially at the place where it comes out of the connecting terminal and immediately behind the free end of funnel 3, as shown in Fig. 4.

There are a number of possible methods of marking. The identification marking can be made directly on the sleeve or on a label associated with a transparent plate as in the example shown, or directly on an opaque

plate. Marking can be made in pencil or by typewriter or by any other suitable means.

In an advantageous method of manufacture, labels 20 and plates 21 are mass-produced in boards 30 and 40 respectively.

Labels 20, constructed in rows in polyester boards 30, can easily be separated from the bottom 31 of board 30, since the edges 25 of the labels are detachable along a dotted line. Two orifices 23 for the plate studs are formed in each label.

Plates 21, manufactured in polyamide boards 40, are also disposed in rows at the same intervals as the boards 30 of labels, so that a board 40 can be superposed on a board 30 and the respective components 20, 21 are opposite one another. Plates 21 are disposed in double rows in recesses 46 in the bottom 45 of board 40, each plate 21 being connected to bottom 45 by a cuttable bridge 47.

This is a method of rapidly obtaining label and plate assemblies by superposition of two boards 30, 40 (Fig. 7), when the studs 22 engage and fit into orifices 23, at least one dimension of which is less than the maximum corresponding dimension of the studs. Each label and plate assembly, which is easily detached from the set, is ready for engagement on a sleeve 11 on a cable 5, in order to complete and position the identification device 10, so that it is integral with or detached from terminal 1.

Fig. 8 is a diagram of an installation for marking by a preferred method according to the invention. A plotting board 50 controlled by a computer 60 marks a board 30 of labels in accordance with a circuit plan previously made by the plotting board. In the case where the identification marking is made directly on opaque plates, the plotting board 50 can simultaneously mark a board 40 of plates.

The terminal according to the invention is thus an efficient, convenient means of identifying electric cables, owing to the great flexibility of positioning and marking. It is economic to manufacture and install on the cable, since the assembly is made up of a small number of detached parts, some of which are removable and thus increase the flexibility of use.

Of course, the invention is not limited to the embodiments described, and numerous modifications can be made thereto without departing from the scope of the invention.

The sleeve cross-section can be triangular or circular or hexagonal or any other appropriate shape. The identification mark can be directly inscribable on the sleeve, in which case the transparent plate prevents the marking from being erased or is coloured so as to assist marking.

The plate can have a larger number of studs so as to increase the friction on the electric cable.

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The sleeve of the identification device can be secured to the cable terminal by annular engagement means or any other appropriate means, reversible or otherwise.

C L A I M S

1. An end terminal of an electric cable, comprising a conducting part (2) for electrically connecting to a conducting core (4) of the cable, and also comprising an insulating body (3) mechanically connected to the conducting part, the body (3) comprising an appendage for holding a cable identification mark, characterised in that the appendage is a tubular sleeve (11) disposed around the cable (5) and at least partly detachable from the body (3) so as to rotate around the cable (5).
2. A terminal according to claim 1, characterised in that the sleeve (11) is connected to the body (3) by at least one cuttable region (8) so that it can be separated from the body (3) after breaking the cuttable region.
3. A terminal according to claim 1 or 2, characterised in that the body (3) is made of plastics integral with the sleeve (11).
4. A terminal according to any of claims 1 to 3, characterised in that the sleeve (11) is for holding a plate (21) for visually identifying the cable, means (16, 22) being provided for positioning the plate (21) on the sleeve (11).
5. A terminal according to claim 4, characterised in that the means (16, 22) for positioning the plate (21) on the sleeve (11) are adapted to lock the sleeve (11) on the cable (5) when the plate (21) is in position on the sleeve (11).

6. A terminal according to claim 4 or 5, characterised in that the sleeve (11) has at least two different surfaces (14, 15), either of which can receive the plate (21).
7. A terminal according to any of claims 4 to 6, characterised in that the plate (21) is made of opaque material suitable for marking so as to identify the cable (5).
8. A terminal according to any one of claims 4 to 6, characterised in that the plate (21) is transparent and covers an identification mark without masking it.
9. A terminal according to claim 8, characterised in that it comprises a label (20) bearing the identification mark, the label being positioned between the transparent plate (21) and a substantially flat surface (14) of the sleeve (11).
10. A terminal according to claim 9, characterised in that the plate (21) comprises means (22) for engaging in label (20) so that a label and plate assembly can be formed by simple pressure.
11. A terminal according to claim 10, characterised in that the engagement means on the plate (21) comprise at least one stud (22), and the label (20) is formed with at least one orifice (23) enabling the stud (22) on the plate to extend through the label and into a corresponding orifice (16) in the sleeve (11).

12. A terminal according to any of claims 4 to 9, characterised in that the means (16, 22) for positioning the plate (21) on the sleeve (11) comprise at least one stud (22) on the plate, for engagement in a corresponding orifice (16) in the sleeve, so that the stud (22) when engaged bears on the cable (5) when the sleeve (11) is mounted on the cable (5).
13. An end terminal for an electric cable substantially as hereinbefore described with reference to, and as shown in Figures 1 to 7 of the accompanying drawings.
14. Any novel feature or combination of features described herein.

Patents Act 1977
Examiner's report to the Comptroller under
Section 17 (The Search Report)

Application number
9122741.3

Relevant Technical fields

(i) UK CI (Edition^K) H2E (EDT), B8F (FBG, FBE)

(ii) Int CI (Edition⁵) H01R, G09F

Databases (see over)

(i) UK Patent Office

(ii)

Search Examiner

F J FEE

Date of Search

13 NOVEMBER 1991

Documents considered relevant following a search in respect of claims 1 TO 14

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
A	GB 0780991 (HELLERMAN)	
A	EP 0115055 A2 (ZOLLER & FRÖUCH)	

Category	Identity of document and relevant passages	Relevant to claim(s)

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